

D E C L A R A T I O N

I, Noboru Tanaka, residing at 7 th Fl., Kioicho Park Bldg., 3-6, Kioicho, Chiyoda-ku, Tokyo, Japan, hereby declare that I have a thorough knowledge of Japanese and English languages, and that the attached pages contain correct translation into English of the application document of Japanese Patent Application No. 2002-356737 filed on December 9, 2002, in the name of CANON KABUSHIKI KAISHA.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made, are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed this 3rd day of December, 2007.



Noboru Tanaka

Translation of Japanese Patent Application No. 2002-356737

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[Title of the Invention] WIRELESS NETWORK CONSTRUCTING
METHOD

[What Is Claimed Is:]

5 [Claim 1] A method of constructing a wireless network
system, comprising:

a display step of displaying plural items of
network identification information, which are stored in
a memory, for identifying wireless network systems;

10 a selecting step of selecting network
identification information of a wireless network system,
which is capable of being constructed anew, from the
plural items of network identification information
displayed at said display step; and

15 a constructing step of constructing a wireless
network system of the network identification
information selected at said selecting step.

[Detailed Description of the Invention]

[0001]

20 [Technical Field to Which the Invention Belongs]

This invention relates to a configuring technique
for constructing a wireless LAN system compliant with
IEEE Std 802.11.

[0002]

25 [Prior Art]

In a system comprising a plurality of computers,
it is becoming more common to construct a local-area

network (LAN) in order to share information and to use information processing devices such as printers more effectively.

[0003]

5 In particular, wireless LAN systems in which all or part of the LAN is implemented wirelessly are gradually coming into greater use. The reason for this is that a wireless LAN system does not require the laying of cables. Consequently, it is believed that
10 wireless LAN systems will be utilized even more extensively in the future in view of the convenience of portable information processing devices such as notebook personal computers.

[0004]

15 In order to construct such a wireless LAN system, it is necessary first of all for the plurality of personal computers (stations) constructing the system to be configured in a prescribed manner. For example, in a case where communication is performed in an
20 infrastructure mode in a wireless LAN system compliant with IEEE Std 802.11, it is necessary to set an ESS (Extended Service Set) - ID, which is a network identification ID, to the same value at the access points and stations that communicate with each other.
25 Furthermore, in a case where encrypted communication is carried out in order to prevent exposure of data, it is required that a WEP (Wired Equivalent Privacy) key,

which is an encryption key, be set to the same value.

[0005]

[Problems That the Invention Is to Solve]

Present access points are usually connected to a
5 computer by some means such as wired means, and the
above-mentioned settings are made by the computer
keyboard. Since this series of operations is
laborious, simplification of it is required.

[0006]

10 Furthermore, since present stations are generally
computers, the above-mentioned settings can be made
using the keyboard of one's own computer. However, in
a case where the above-mentioned settings will be made
in the future at stations having various forms such as
15 that of a facsimile machine, copier or printer, there
is a possibility that the settings will entail labor
just as in the case of access points at present.

[0007]

In some wireless LAN systems at the present time,
20 settings are made at the factory at shipping time so
that the systems can be put into operation as is. This
mitigates labor involved in making settings. However,
in a case where a plurality of independent wireless LAN
systems are disposed in close proximity to one another,
25 it may be judged that these independent wireless LAN
systems belong to the same network if the settings
values of each of the systems agree. There is such a

problem that the wireless LAN system is not capable of avoiding the interference ascribable to above settings.

[0008]

Accordingly, an object of the present invention
5 is to facilitate the implementation of prescribed settings necessary to construct a wireless network system.

[0009]

Another object of the present invention is to
10 avoid interference between independent wireless network systems ascribable to configuring of these networks.

[0010]

[Means of Solving the Problems]

In order to accomplish the objects, there is
15 provided a method of constructing a wireless network system, comprising: a display step of displaying plural items of network identification information, which are stored in a memory, for identifying wireless network systems; a selecting step of selecting network
20 identification information of a wireless network system, which is capable of being constructed anew, from the plural items of network identification information displayed at said display step; and a constructing step of constructing a wireless network system of the
25 network identification information selected at said selecting step.

[0011]

[Embodiments]

Preferred embodiments of the present invention will now be described in detail with reference to the drawings.

5 [0012]

[First Embodiment]

A first embodiment will be described taking as an example a facsimile machine serving as a wireless LAN device (station) or access point connectable to a
10 wireless LAN system compliant with IEEE Std 802.11.

[0013]

Fig. 1 is an external view of a facsimile machine according to a first embodiment of the present invention. This facsimile machine is provided in a
15 form having a built-in wireless LAN communication unit, described later, and functions as an access point. However, this does not impose a limitation upon the invention because a wireless LAN communication unit of removable-adaptor type may just as well be attached to
20 the facsimile machine.

[0014]

As shown in Fig. 1, the facsimile machine has a main body 100 provided with buttons 101 functioning as information input means and with a display panel 102
25 functioning information output means.

[0015]

Fig. 2 is a block diagram illustrating components

relating to the configuring of the facsimile machine shown in Fig. 1. Components same to those shown in Fig. 1 are designated by same reference characters and need not be described again.

5 [0016]

A controller 201 in Fig. 2 controls the overall facsimile machine 100. A memory 202, which serves as storage means, stores image data to be transmitted, fax data that has been received, and other data. A
10 wireless LAN communication unit 203 controls communication in the form of an access point in a wireless LAN system. The controller 201 comprises a CPU for exercising control in accordance with a prescribed program, a RAM in which a work area used
15 when the CPU executes control has been defined, and a ROM in which the program of the CPU and control data have been stored.

[0017]

Components and a setting method about settings
20 when the facsimile machine 100 of the first embodiment is set up in a wireless LAN system as an access point will now be described.

[0018]

Fig. 3 is a diagram illustrating the details of
25 the buttons according to the first embodiment. As shown in Fig. 3, the buttons 101 include numeral buttons 301, a mode button 302, up/down buttons 303, an

enter button 304 and right/left buttons 305.

[0019]

The controller 201 sends and receives data to and from the buttons 101, display panel 102, memory 202 and
5 wireless LAN communication unit 203 and processes data.

[0020]

Described next is the procedure of an operation performed at the facsimile machine serving as an access point. The operation is for setting an ESS-ID of an
10 ESS (Extended Service Set), which includes one or more BSSs (Basic Service Sets), in one communication-enabled area (referred to also as a service area or cell) composed of an access point and wireless LAN communication device (station) in infrastructure mode.

15 [0021]

First, a screen of the kind shown in Fig. 4 for selecting an ESS-ID setting mode is displayed on the display panel 102 by pressing the mode button 302 of Fig. 3 a prescribed number of times. The ESS-ID
20 setting mode is activated when the enter button 304 is pressed in accordance with this display on the screen.

[0022]

In the ESS-ID setting mode, correspondence between numerals "0" to "9" and symbol strings of one
25 or more characters corresponding to the numerals is displayed, as shown in Fig. 5. If a single screen cannot be displayed on the display panel 102, the

screen can be scrolled by the up/down buttons 303 to enable display of data in successive fashion. Further, the corresponding relationship between the numerals and the symbol strings of one or more characters

5 corresponding to the numerals has already been stored in the memory 202. The controller 201 reads this data out of the memory 202 and displays it on the display panel 102.

[0023]

10 Next, the wireless LAN communication unit 203 receives notification information being transmitted from peripheral wireless LAN access points 601, 602 of the kind shown in Fig. 6, and the controller 201 detects the ESS-IDs in the notification information of
15 the peripheral wireless LAN access points 601, 602, compares them with all of the symbol strings in the memory 202 and outputs the result of the comparison. In the example depicted in Fig. 6, agreement is achieved with respect to "abcbabcabc" and therefore the
20 controller 201 displays "BUSY" in the field of numeral 1, as illustrated in Fig. 7. In a case where the user wishes to newly construct an independent wireless LAN system, the user selects a symbol string other than the busy "abcbabcabc". As a result, the controller 201 sets
25 the selected symbol string as ESS-ID and, as shown in Fig. 8, is capable of newly constructing an independent wireless LAN system whose ESS-ID is "Tokyo", for

example.

[0024]

By way of example, in order to set the ESS-ID to "Tokyo" as an access point of the new wireless LAN system, "2" being displayed to the left of "Tokyo" in Fig. 7 is entered using the numeral buttons 301. Alternatively, if it has been decided beforehand that the middle line among the three displayed lines is to be the line selected, then the ESS-ID can be set by pressing the enter button 304 under the conditions shown in Fig. 9.

[0025]

Further, not only can the ESS-ID be set but it is also possible to similarly set an encryption key for communication data. To set the encryption key, the mode button 302 is pressed a prescribed number of times, whereupon the controller 201 causes the display panel 102 to display a screen of the kind shown in Fig. 10 for selecting a WEP key setting mode. The WEP-key setting mode is activated when the enter button 304 is pressed in accordance with this display on the screen. In the WEP-key setting mode, as shown in Fig. 11, correspondence between numerals 0 to 9 and symbol strings of one or more characters corresponding to the numerals is displayed. These strings are for the WEP key. Further, the corresponding relationship between the numerals and the symbol strings of one or more

characters corresponding to the numerals has already been stored in the memory 202 in an area thereof separate from that in which the list of ESS-IDs has been stored.

5 [0026]

In a case where "67E14088A3" has been set anew as the WEP key of the wireless LAN system, "2" is entered using the numeral buttons 301. Alternatively, if it has been decided beforehand that the middle line among
10 the three displayed lines is to be the line selected, then the WEP key can be set by pressing the enter button 304 under the conditions shown in Fig. 11.

[0027]

Thus, in accordance with the first embodiment,
15 the prescribed settings of an access point can be made with facility when a facsimile machine is made to function as an access point and a wireless LAN system is constructed anew.

[0028]

20 Further, though the first embodiment has been described taking as an example a case where prescribed settings are made for an access point, it goes without saying that prescribed settings for a station can also be performed with facility.

25 [0029]

[Second Embodiment]

A second embodiment according to the present

invention will now be described in detail with reference to the drawings.

[0030]

The second embodiment will be described taking as
5 an example a digital copier serving as a wireless LAN device (station) or access point connectable to a wireless LAN system compliant with IEEE Std 802.11.

[0031]

Fig. 12 is an external view of a digital copier
10 according to the second embodiment of the present invention. This digital copier is provided in a form having a built-in wireless LAN communication unit, described later, and functions as a station. However, a wireless LAN communication unit may just as well be
15 attached in freely removable fashion as set forth in the first embodiment.

[0032]

As shown in Fig. 12, the digital copier has a main body 1200 provided with numeral buttons 1201
20 functioning as information input means. The numeral buttons 1201 are shown in detail in Fig. 14. A touch-sensitive panel 1202 functions as information output means and information input means.

[0033]

25 Fig. 13 is a block diagram illustrating components relating to the configuring of the wireless LAN system in the digital copier. Components same to

those shown in Fig. 12 are designated by same reference characters and need not be described again.

[0034]

A controller 1301 in Fig. 13 controls the overall
5 digital copier 1200. A memory 1302, which serves as
storage means, stores image data that has been read by
an image reader, and other data. A wireless LAN
communication unit 1303 controls communication in the
form of a station of a wireless LAN system. The
10 controller 1301 comprises a CPU for exercising control
in accordance with a prescribed program, a RAM in which
a work area used when the CPU executes control has been
defined, and a ROM in which the program of the CPU and
control data have been stored.

15 [0035]

The controller 1301 sends and receives data to
and from the buttons 1201, touch-sensitive panel 1202,
memory 1302 and wireless LAN communication unit 1303
and processes data.

20 [0036]

Described next is a method of setting up a
digital copier to infrastructure mode or ad-hoc mode of
a wireless LAN communication mode.

[0037]

25 First, a screen of the kind shown in Fig. 15 for
selecting a wireless LAN communication mode is
displayed by pressing, a prescribed number of times, a

portion indicating "SET" displayed on the touch-sensitive panel 1202. The mode for setting wireless LAN communication is established when a portion indicating "ENTER" displayed on the screen is pressed.

5 [0038]

In the mode for setting wireless LAN communication, first a screen for selecting whether infrastructure mode or ad-hoc mode is displayed, as shown in Fig. 16. If the ad-hoc mode is selected and
10 the portion indicating "ENTER" is pressed, a screen for selecting the communication channel is displayed, as illustrated in Fig. 17. The channel selection may be implemented by a method of inputting a numeral directly using the numeral buttons 1201 or by pressing a portion
15 on which the numeral of the desired channel is being displayed among the numerals "1" to "14" displayed on the touch-sensitive panel 1202. Finally, by pressing the portion indicating "ENTER", the communication mode can be set to the ad-hoc mode.

20 [0039]

In a case where the infrastructure mode has been selected on the screen shown in Fig. 16, a screen for setting the above-mentioned ESS-ID and, if necessary, the WEP key, is displayed. This procedure is in line
25 with the setting method described in the first embodiment and need not be described again.

[0040]

Thus, in accordance with the embodiments, as described above, the prescribed settings necessary for constructing a wireless LAN system can be made with facility by the wireless LAN communication device
5 itself. In addition, it is possible to avoid interference between independent wireless LAN systems.

[0041]

The present invention can be applied to a system constituted by a plurality of devices (e.g., a host
10 computer, interface, reader, printer, etc.) or to an device comprising a single device (e.g., a copier or facsimile machine, etc.).

[0042]

Furthermore, it goes without saying that the
15 object of the invention is attained also by supplying a recording medium storing the program codes of the software for performing the functions of the foregoing embodiments to a system or an device, reading the program codes with a computer (e.g., a CPU or MPU) of
20 the system or apparatus from the recording medium, and then executing the program codes.

[0043]

In this case, the program codes read from the recording medium implement the novel functions of the
25 embodiment and the recording medium storing the program codes constitutes the invention.

[0044]

Examples of recording media that can be used for supplying the program code are a floppy disk, hard disk, optical disk, magneto-optical disk, CD-ROM, CD-R, magnetic tape, non-volatile type memory card or ROM,
5 etc.

[0045]

Furthermore, besides the case where the aforesaid functions according to the embodiments are implemented by executing the program codes read by a computer, it
10 goes without saying that the present invention covers a case where an operating system or the like running on the computer performs a part of or the entire process in accordance with the designation of program codes and implements the functions according to the embodiments.

15 [0046]

It goes without saying that the present invention further covers a case where, after the program codes read from the recording medium are written in a function expansion board inserted into the computer or
20 in a memory provided in a function expansion unit connected to the computer, a CPU or the like contained in the function expansion board or function expansion unit performs a part of or the entire process in accordance with the designation of program codes and
25 implements the function of the above embodiments.

[0047]

[Effect of the Invention]

Thus, in accordance with the embodiments of the present invention, as described above, the prescribed settings necessary for constructing a wireless network system can be made with facility. Moreover, it is possible to avoid interference between independent wireless network systems ascribable to settings.

[Brief Description of the Drawings]

[Fig. 1]

Fig. 1 is an external view of a facsimile machine according to a first embodiment of the present invention;

[Fig. 2]

Fig. 2 is a block diagram illustrating components relating to the configuring of the facsimile machine shown in Fig. 1;

[Fig. 3]

Fig. 3 is a diagram illustrating the details of buttons according to the first embodiment;

[Fig. 4]

Fig. 4 is a diagram illustrating a screen for selecting an ESS-ID setting mode;

[Fig. 5]

Fig. 5 is a diagram illustrating an example of display of numerals "0" to "9" and symbol strings of one or more characters corresponding to these numerals;

[Fig. 6]

Fig. 6 is a diagram illustrating access points of

neighboring wireless LAN systems;

[Fig. 7]

Fig. 7 is a diagram illustrating a screen displaying ESS-IDs of neighboring wireless LAN systems;

5 [Fig. 8]

Fig. 8 is a diagram illustrating a state in which an independent wireless LAN system has been constructed anew;

[Fig. 9]

10 Fig. 9 is a diagram illustrating a screen for setting the ESS-ID of the new wireless LAN system;

[Fig. 10]

Fig. 10 is a diagram illustrating a screen for selecting a WEP-key setting mode;

15 [Fig. 11]

Fig. 11 is a diagram illustrating an example of display of numerals "0" to "9" and symbol strings of one or more characters corresponding to these numerals, these being provided for a WEP key;

20 [Fig. 12]

Fig. 12 is an external view of a digital copier according to a second embodiment of the present invention;

[Fig. 13]

25 Fig. 13 is a block diagram illustrating components relating to the configuring of a wireless LAN system in a digital copier;

[Fig. 14]

Fig. 14 is a diagram illustrating the details of numeral buttons;

[Fig. 15]

5 Fig. 15 is a diagram illustrating a screen for selecting a wireless LAN communication mode;

[Fig. 16]

Fig. 16 is a diagram illustrating a screen for selecting whether a communication mode is
10 infrastructure mode or ad hoc mode; and

[Fig. 17]

Fig. 17 is a diagram illustrating a screen for selecting a communication channel.

[Description of the Reference Numerals]

15	100	MAIN BODY
	101	BUTTONS
	102	DISPLAY PANEL
	201	CONTROLLER
	202	MEMORY
20	203	WIRELESS LAN COMMUNICATION UNIT
	301	NUMERAL BUTTONS
	302	MODE BUTTON
	303	UP/DOWN BUTTONS
	304	ENTER BUTTON
25	305	RIGHT/LEFT BUTTONS
	601	PERIPHERAL WIRELESS LAN ACCESS POINT
	602	PERIPHERAL WIRELESS LAN ACCESS POINT

- 1200 DIGITAL COPIER
- 1201 NUMERAL BUTTONS
- 1202 TOUCH-SENSITIVE PANEL
- 1301 CONTROLLER
- 5 1302 MEMORY
- 1303 WIRELESS LAN COMMUNICATION UNIT

[Type of the Document] Drawings

FIG. 1

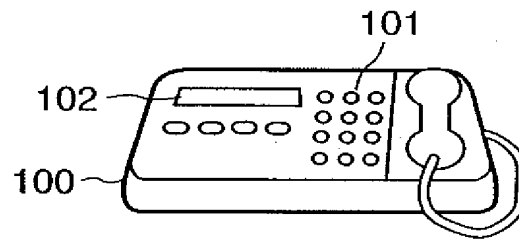


FIG. 2

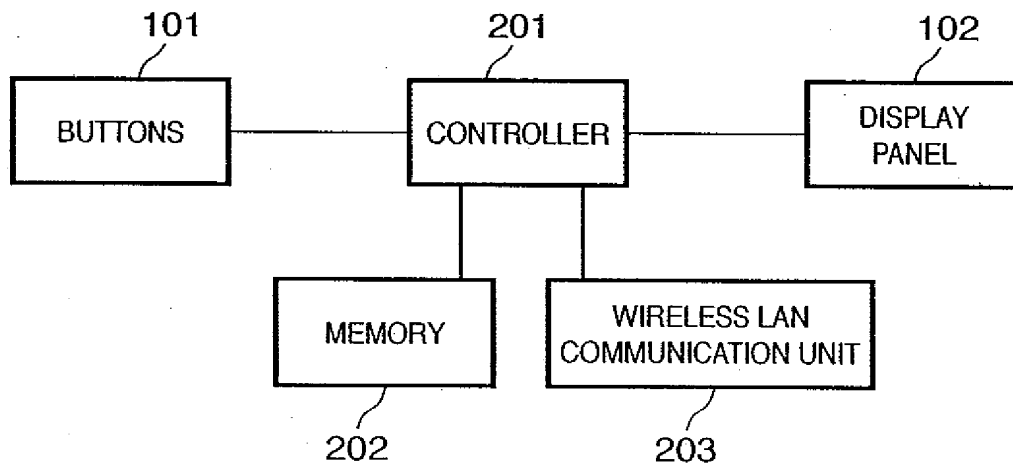


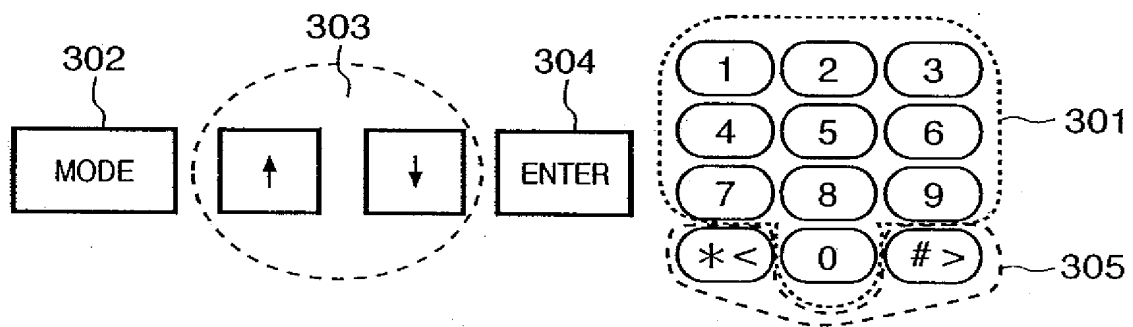
FIG. 3

FIG. 4

SET ESS-ID (EXECUTE BY PRESSING "ENTER")

FIG. 5

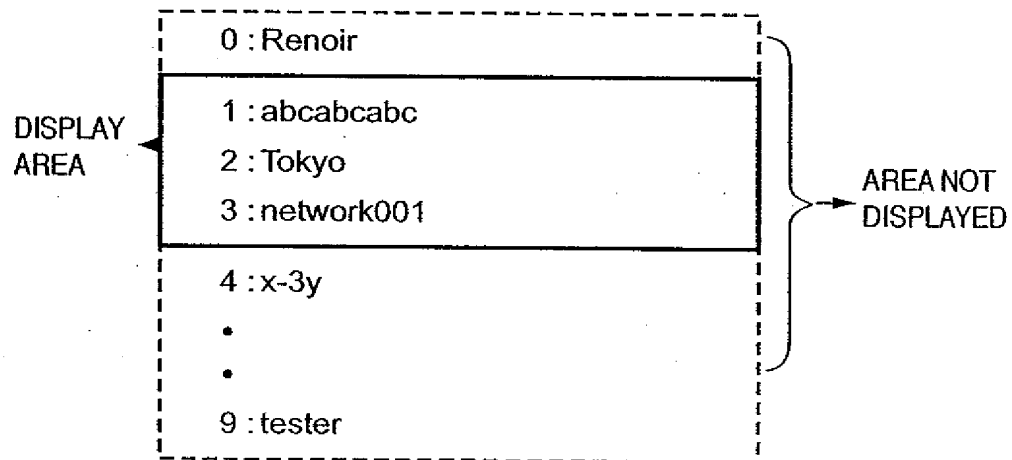


FIG. 6

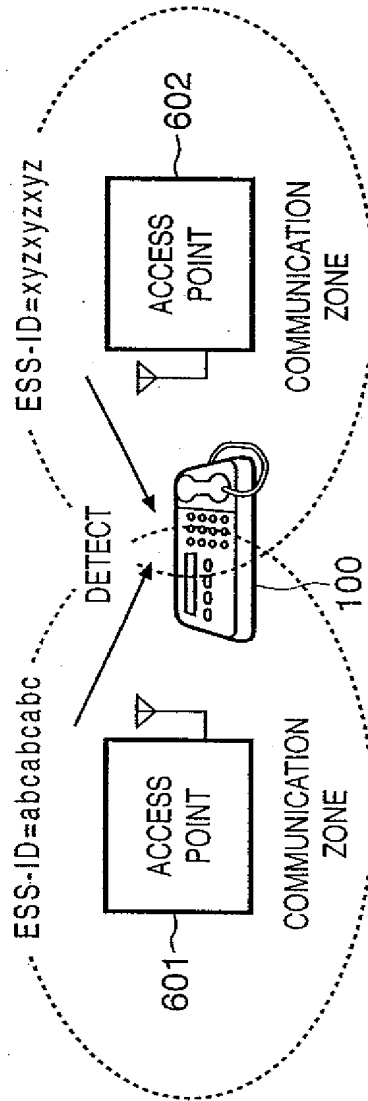


FIG. 7

1:abccabcc [BUSY]

2:Tokyo

3:network001

FIG. 8

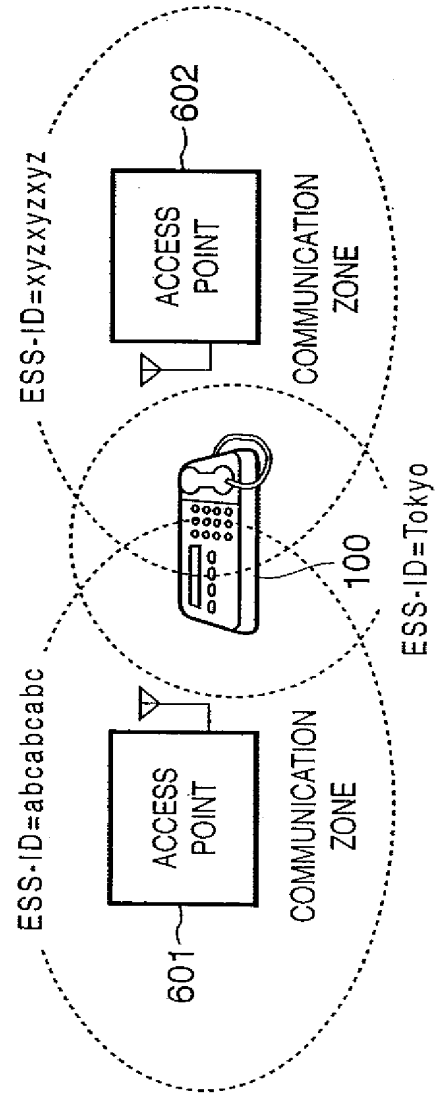


FIG. 9

(SELECT)

1:abcabcabc [BUSY]

2:Tokyo

3:network001

FIG. 10

SET WEP KEY (EXECUTE BY PRESSING "ENTER")

FIG. 11

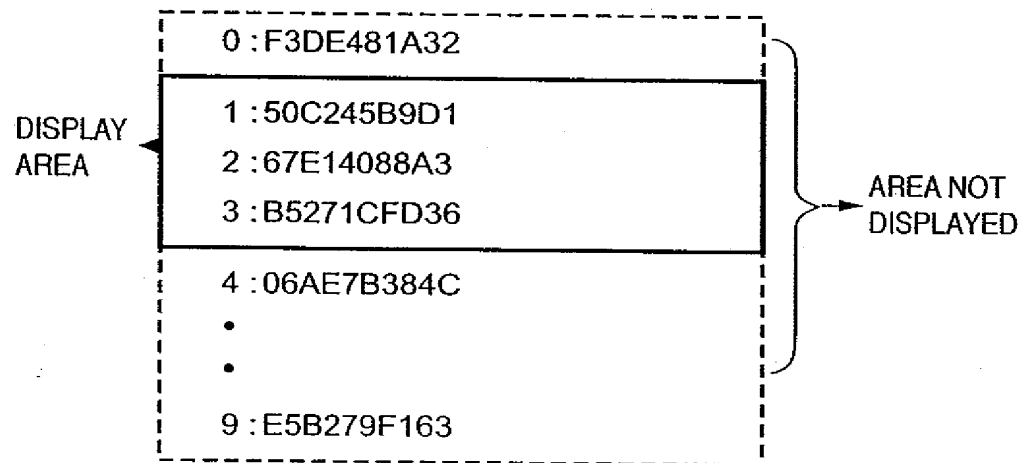


FIG. 12

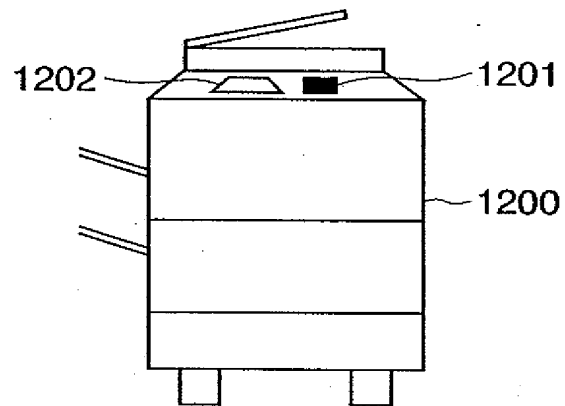


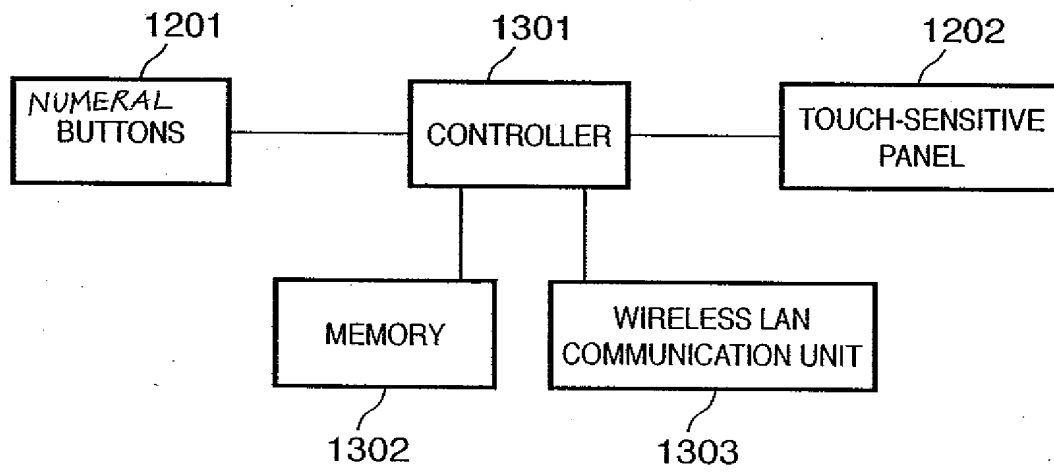
FIG. 13

FIG. 14

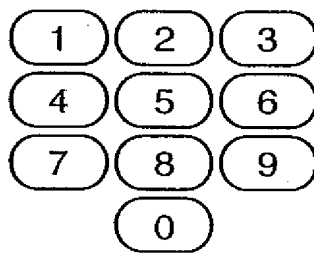


FIG. 15

SELECT WIRELESS LAN COMMUNICATION MODE EXECUTE BY PRESSING "ENTER"	SET
	ENTER

FIG. 16

<WIRELESS LAN COMMUNICATION MODE>		SET
INFRASTRUCTURE MODE		
SELECT	AD-HOC MODE	
EXECUTE BY PRESSING "ENTER"		ENTER

FIG. 17

<SELECT COMMUNICATION CHANNEL>		SET
①②③④⑤⑥⑦		
⑧⑨⑩⑪⑫⑬⑭	14	
EXECUTE BY PRESSING "ENTER"		ENTER

[Type of the Document] Abstract

[Abstract]

[Problem] To facilitate the implementation of prescribed settings necessary to construct a wireless
5 network system.

[Solving Means] Multiple items of network identification information, which are for identifying wireless network systems, are read out of a memory 202 and displayed on a display unit 102. Network
10 identification information of a wireless network system, which is capable of being constructed anew, is selected from the multiple items of network identification information displayed and a wireless network system corresponding to the network
15 identification information selected is constructed.

[Selected Drawings] Fig. 2